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A new fossil Monocotyledon from the Yellow Gravel at Bridgeton, N. J.*

By Arthur Hollick.

(Plates 311–313.)

Anomalophyllites Bridgetonensis n. sp.

Leaf remains consisting of linear, or sub-linear, or broad, parallel-margined fragments, varying from two and one-half inches to three-fourths inch in width; the broader fragments gently wavy longitudinally and occasionally with a narrow, flattened area, parallel with one of the margins; the narrower fragments often longitudinally plicated or folded. Median nerves generally well defined in the broader fragments, less so, or absent in the narrower ones, occasionally with a well-defined parallel nerve on each side, or buried between the central folds. Surface smooth or obscurely striated longitudinally. Petioles two inches or more in width, rounded (semicircular?) in outline, finely striate longitudinally.

Formation and locality: Tertiary (Miocene?), Bridgeton, N. J.

The fragments figured on the accompanying plates have been selected from a large number collected, which undoubtedly represent the remains of a monocotyledon, almost certainly belonging to the palms.

The first specimens, found many years ago, were of medium size

* Other references to the locality or to the fossil may be found in the following contributions:

1. Palaeobotany of the Yellow Gravel at Bridgeton, N. J. Bull. Torrey Bot. Club, 19: 330. 1892.

2. New Species of Leguminous Pods from the Yellow Gravel at Bridgeton, N. J. *l. c.*, 23: 46. 1896.

3. A New fossil Grass from Staten Island. *l. c.*, 24: 122. 1897.

and were thought by Dr. N. L. Britton to be portions of grass leaves, allied to or identical with *Zizania*.* Some of these are depicted in figs. 1, 2 and 3, plate 313.

A yet smaller fragment, represented by fig. 6, plate 311, was submitted to Prof. Leo Lesquereux, who identified it as "*Cyperites*, spec?" †

Material subsequently collected by the late Dr. J. I. Northrop, by the Geological Survey of New Jersey and by me personally indicates that the fragments are not parts of single blade-like leaves, but dismembered portions of palmate leaves, like those of a fan palm, connected toward the petiole and separated into free divisions toward the margin.

Basal portions I consider to be represented by figs. 2–5, pl. 313, which are narrow and strongly plicated or folded; median portions by figs. 1–4, pl. 312, and figs. 1, 6 and 7, pl. 313. In figures 1 and 6 of the latter plate the place of separation of the free divisions is indicated at the summits. Portions of the free divisions are apparently represented by figs. 1–3, pl. 311, and portions of the petioles by figs. 4 and 5, pl. 311. Leaves of *Ulmus plurinervia* Ung. and *Quercus Klipsteinii* Etts., included respectively in figs. 1 and 5, pl. 311, have no special significance, except as an indication of the accompanying vegetation, which, it is hoped, will be described in full at some future time. The almost total absence of surface striations I believe may be accounted for by the character of the medium in which the fragments are preserved—a rather coarse, friable sandstone.

Upon examining the literature of tertiary palaeobotany many fragments similar to ours may be found described and figured by Gaudin, Heer, Watelet and others, under the genera *Cyperites*,‡ *Flabellaria*,§ *Phoenicites*,‖ *Anomalophyllites*,¶ etc.—the first one supposed to represent the sedges, the others palms.

* Proc. Am. Assn. Adv. Sci. 31: 359 (1882); Trans. N. Y. Acad. Sci. 4: 31 (1884–85).

† Proc. U. S. Natl. Mus. 10: 36 (1887). Museum no. 2314.

‡ *Cyperites Montalionis* Gaud. Mem. Gisem. Feuill. Foss. Toscane, 1: 29. *pl. 11, fig. 7; C. multinervosus* Heer, Fl. Tert. Helvet, 1: 76. *pl. 28, fig. 6.*

§ *Flabellaria* (indéterminés) Wat. Plant. Foss. Bass. Paris, 97. *pl. 27, figs. 6, 7.*

‖ *Phoenicites eocenica, l. c.*, 98. *pl. 27, figs. 1–5.*

¶ *Anomalophyllites tricarinatus, l. c.*, 100. *pl. 28, figs. 1–5; A. dubius, l. c. figs. 6–8.*

As I consider the Bridgeton specimens to almost certainly belong in the latter family, but without any characters by which they can be identified positively with any living genus, I have thought it advisable to include them under *Anomalophyllites*, with a specific name to indicate the locality where they were found.

The abundance of these remains is evidence that the plant to which they belonged was an important element in the flora of the region and of that of the geological age in which they flourished, and considerably extends our knowledge of the geographical range of palms in the past.

Explanation of Plates.

PLATE 311.

Figs. 1–3.—*Anomalophyllites Bridgetonensis* Hollick. Fragments of free divisions; fig. 1 including leaf cf *Ulmus plurinervia* Ung.

Figs. 4 and 5.—Fragments of petioles; fig. 5 including leaf of *Quercus Klipsteinii* Etts.

Fig. 6.—Fragment of a free division. ("*Cyperites*, spec?" Lesq.)

PLATE 312.

Figs. 1–4.—*Anomalophyllites Bridgetonensis* Hollick. Fragments of median portion of leaf.

PLATE 313.

Figs. 1, 6 and 7.—*Anomalophyllites Bridgetonensis* Hollick. Fragments of median portion of leaf; figs. 1 and 6 showing indications of separation into free divisions at summits.

Figs. 2, 3–5.—Fragments of basal portion of leaf, showing folds.

Studies in the Botany of the southeastern United States.—XI.

BY JOHN K. SMALL.

I. NOTEWORTHY SPECIES.

SAGITTARIA FILIFORMIS J. G. Smith, Rep. Mo. Bot. Gard. 6: 46. *pl. 15.* 1894.

Mr. A. H. Curtiss has sent me fine fruiting specimens of this rare species, collected near Jacksonville, Florida. They are apparently the first specimens found with mature achenes; these are of the same general outline as the immature achenes figured by Mr. Smith, but slightly broader. In the center of each face there is an oblong swelling surrounded by a depression, while the edges

are crested. The lengths of numerous achenes vary from 1.5–2 mm.

ARENARIA BREVIFOLIA Nutt.; T. & G. Fl. N.A. 1: 180. 1838.

I have long suspected the occurrence of this, the rarest of our eastern American *Arenarias*, in North Carolina. In 1890 Mr. Heller collected fragmentary and imperfect specimens of an *Arenaria* in Rowan County. Some years later I found similar specimens on Dunn's Mountain, near Salisbury. During the spring of 1896 I had an opportunity to visit Dunn's Mountain and found the species in full bloom just as it occurs on Stone Mountain, Georgia; the plants from the two mountains are almost identical.

RHEXIA MARIANA L. Sp. Pl. 346. 1753.

As far as I have observed, *Rhexia Mariana* prefers sandy places at no great distance from the Atlantic and Gulf coasts, although it does occur at many points in the middle districts of the Southern States, and is said to extend up the Mississippi Valley to Missouri. The first altitude worthy of note at which I found the species was at about 300 meters on Stone Mountain, Georgia. The following year, 1895, I collected a few specimens of a delicate form, apparently referable to this species, on the mountains near Ellijay, Gilmer County, Georgia, at an altitude of about 400 meters. The leaves of this form are thin, oval, ovate or elliptic and short-petioled. Much to my surprise, on reaching the summit of Table Mountain, South Carolina, last summer, I found the typical state of the plant thriving at an altitude of almost 1000 meters.

SABBATIA CAMPANULATA (L.) Britton, Mem. Torr. Club, 5: 259. 1894.

Dr. Gray has recorded * the mountains of Georgia as an extension of the range of this normally coast plant. I do not know to how great an altitude the species ranges in Georgia, but I have collected it at an elevation of nearly 1000 meters on the summit of Table Mountain, South Carolina, and the only noticeable difference between the mountain specimens and those from the low-

* Syn, Fl. 2: Part 1, 115.

lands is the proportionate breadth of the leaves, these being wider in the plants from the higher altitudes.

PHACELIA HIRSUTA Nutt. Trans. Am. Phil. Soc. (II.) 5: 191. 1833–37.

Although classed as an annual, this *Phacelia* appears to be a biennial. Mr. Nuttall, in the original description, says "annual or perhaps also biennial." On Stone Mountain, Georgia, the species flowers in the spring, the plants soon die and disappear on account of the extreme heat, the seeds falling to the ground at once germinate, producing tufts of spatulate, oblong-spatulate or obovate, short-petioled, sharply serrate leaves which are not in the least pinnatifid, as are those of the following season.

VITEX AGNUS-CASTUS L. Sp. Pl. 637. 1753.

This shrub is fast becoming naturalized in the Southern States. Miss K. S. Taylor found it about Columbia, South Carolina, in 1891, and I collected it in 1895 at both Darien and near Fort Barrington, in southeastern Georgia.

CESTRUM PARQUI L'Her. Stirp. Nov. 73. 1783–84.

We have no record of the occurrence of this species on our eastern sea-board, but it is now doubtless established at many places in the Southern States. In 1895 I found quantities in and about Darien, Georgia.

LEONOTIS NEPETAEFOLIA Ait. Hort. Kew. Ed. 2, 3: 409. 1811.

Dr. Chapman reports this introduced plant from Georgia and Florida. We now have excellent specimens collected by Prof. Underwood at Auburn, Lee County, Alabama.

FILAGO NIVEA.

Evax multicaulis DC. Prodr. 5: 459. 1836. Not *Filago multicaulis* Lam. 1778.

This is one of the Compositae belonging west of the Mississippi River that has been traveling gradually eastward; in 1895 I found it very plentiful about Stone Mountain, Georgia.

II. New Species.

Listera reniformis.

Perennial, fleshy, deep green. Stem erect, 1–3 dm. tall, slender glabrous or nearly so below, densely glandular-pubescent above, simple; leaves 2, opposite, about the middle of the stem, reniform or ovate-reniform, 1–3 cm. in diameter, apiculate or short acuminate, glabrous above, more or less pubescent beneath, cordate or subcordate, sessile; racemes 2–10 cm. long; flowers greenish; bracts lanceolate or ovate-lanceolate, 3–5 mm. long, acute; pedicels slender, 4–7 mm. long, glabrate, or much less pubescent than the stem; sepals oblong or linear oblong, about 3 mm. long, obtuse or acutish, reflexed; lip wedge-shaped, 6–7 mm. long, with 2 prominent teeth on both sides near the base, sharply cleft to near the middle, the lobes rounded; capsules oval, 4–5 mm. long; mature seeds not seen.

Damp thickets on the mountains of Maryland, Virginia and North Carolina, ranging from about 1000 to 1750 meters altitude. Spring and summer.

It seems strange that this well marked species should have been so long associated with the northern *Listera convallarioides* It is confined to the higher parts of the southern Alleghany mountains, while *Listera convallarioides* appears to have a northern transcontinental range suggesting that of *Polygonum Douglasii*. *Listera reniformis* differs from its northern relative in its more slender habit, the reniform type of the leaves, which are apiculate or short-acuminate at the apex and cordate or subcordate at the base, and the lip, which is sharply cleft, often nearly to the middle, by a V-shaped sinus. The leaf of *Listera convallarioides* is oval and obtuse at both ends, while the lip is cut by a U-shaped sinus.

Asarum callifolium.

Perennial, deep green, nearly glabrous. Leaves tufted, long-petioled, the blades ovate, 5–9 cm. long, obtuse or sometimes acutish, finely undulate or crenulate, rarely mottled, deeply cordate at the base; petioles 2–3 times longer than the blades, sparingly pubescent; bracts reniform, ciliate; pedicels as long as the calyx, or much shorter; calyx urn-shaped, 1.5–2.5 cm. long, dark green without, dark purple within, the segments broadly ovate or broader than high, the throat slightly contracted; stigmas 2-cleft, capsule not seen.

In shady woods, Florida. (Chapman.)

This is probably the *Asarum arifolium* of Dr. Chapman's Flora, but not the plant of Michaux, specimens of which I have never seen from further south than Georgia. It differs from *Asarum arifolium* in both foliage and inflorescence. The leaf-blades are simply ovate, and lack the halberd-shape so characteristic of those of the Michauxian plant, and the margin instead of being entire is finely undulate or crenulate. The pedicels are always short, never elongating like those of *A. arifolium*, while the perianths of the two species are entirely dissimilar in shape; that of *Asarum callifolium* being larger, much shorter in proportion to the length and with a rounder base.

ARISTOLOCHIA CONVOLVULACEA.

Perennial, slender, bristly-pubescent throughout. Stems erect or decumbent, 1–3 dm. long, angled, slightly flexuous, simple, or rarely branched below; leaves thinnish, becoming firm at maturity, broadly ovate to oval, 2–8 cm. long, short-acuminate or rarely acute, ciliate, deeply cordate at the base, short-petioled; petioles .5–1.5 cm. long, hirsute; peduncles slender, 1–2-flowered, flexuous, angled; calyx densely hirsute, the tube .5–1 cm. long, the limb 6–8 mm. broad, scarcely lobed; capsule subglobose, 6–7 mm. in diameter, pubescent.

In woods, " . . . Columbus, Georgia. Grows from Athens to near this place " (Boykin).

Dr. Boykin noticed the differences between *Aristolochia Serpentaria* and the one here described as new, many years ago. Besides observing the plant in the field, he cultivated it in his garden, and sent both native and cultivated specimens to Dr. Torrey in whose herbarium they are preserved.

Aristolochia convolvulacea can readily be distinguished from *A. Serpentaria* by either the pubescence or the foliage. In place of the soft pilose hairs characteristic of *Aristolochia Serpentaria*, we find a bristly-hirsute pubescence on all parts of the plant. The leaves are much broader in proportion to their length than those of its relative, resembling closely those of some Convolvulaceae, whence the name.

PARONYCHIA SCOPARIA.

Perennial, rather slender, the foliage minutely pubescent. Stem much branched at the base, the branches tufted, erect or

ascending, 2–3 dm. tall, simple below, sparingly forked above, roughish; leaves linear-filiform, 1–3 cm. long, acute, grooved on either side of the midrib, serrulate-ciliate, especially near the apex, sessile; stipules linear-lanceolate, 1–1.5 cm. long, attenuate; branches of the cymes erect or strongly ascending; sepals linear-lanceolate, gradually narrowed to the apex, 3–3.5 mm. long, firm, keeled, usually with a short lateral nerve on each side of the keel, hooded, prolonged into a stout ascending cusp, which is one-third to one-fourth as long as the body; petals none; stamens half as long as the sepals; anthers yellowish.

The specimens on which the above species is founded were collected by Dr. Edward Palmer, in the Indian Territory, between Fort Cobb and Fort Arbuckle, in 1868. (No. 27.)

As far as I know, *Paronychia scoparia* has not been referred to any previously described species. It is related to *P. dichotoma*, differing in the more robust habit, the minutely pubescent foliage and the strict few-flowered cymes. *Paronychia scoparia* has a larger calyx than *P. dichotoma*, the cusps are longer and more densely spiny-ciliate, and the calyx-segments are more strongly ribbed on the back.

Paronychia chorizanthoides.

Annual, slender, minutely pubescent. Stem erect, 1–2 dm. tall, forking from a point 3–8 cm. above the base; leaves linear-filiform, .8–2 cm. long, acute, with a stout midrib, sessile; stipules lanceolate, silvery, acuminate; calyx short-pedicelled, or nearly sessile, 1.5 mm. long, strigose at the base, finally urn-shaped, the base much enlarged; sepals ovate or ovate-lanceolate, with a stout midrib, abruptly contracted into the ascending cusps which are about one-half as long as the body at maturity; utricle nearly 1 mm. broad.

The specimens on which the species here described as new is founded were collected by Dr. Edward Palmer at Bluffton, Burnet County, Texas, 50 miles west of Georgetown, October 10–15, 1879, according to printed ticket, or 1883, no. 1169, according to written label. Heretofore specimens of this collection have been referred to *Paronychia setacea*, which species, however, they but slightly resemble. *Paronychia chorizanthoides*, as the name suggests, bears a remarkable resemblance to some species of *Chorizanthe*, chiefly on account of the involucre-like calices. In *Paronychia chorizanthoides* the bracts subtending the calyx are shorter than that organ, while

in *P. setacea* they are longer. The calyx of the new species is sharply diagnostic, being urn-shaped with a much enlarged base, the calyx of *P. setacea* being turbinate and narrowed at the base. The cusps terminating the sepals are much stouter and only about one-half as long as the very slender cusps of *P. setacea*. Mr. Heller's number 1729, distributed as *P. setacea*, is *Paronychia chorizanthoides*, but, being quite young, it has not yet assumed the characteristic habit that Dr. Palmer's specimens exhibit.

SIPHONYCHIA CORYMBOSA.

Perennial, stoutish, the foliage pubescent with recurved hairs. Stem branched at the base, the branches tufted, 1–3 dm. tall, erect or ascending, olive-green or brownish, forking, especially above, ribbed, topped by the corymbosely disposed cymes; leaves oblanceolate to oblong-oblanceolate, .5–1.5 cm. long, acutish, ciliate, sessile; stipules ovate, silvery, long-acuminate; inflorescence silvery; calyx 2–2.2 mm. long, pubescent at the base, the segments oblong or ovate-oblong, white, longer than the tube, obtuse, concave, slightly hooded at the apex; stamens included; style exserted; utricle ovoid, 1 mm. long.

The original specimens were collected by Professor L. M. Underwood on Ship Island, on the coast of Mississippi, in June, 1896.

Siphonychia corymbosa is most closely allied to *Siphonychia erecta*, which it simulates in habit. The characteristic difference in appearance between the two species is in the foliage, that of *S. erecta* being glaucous, while that of the new species is clothed with a pubescence consisting of short recurved hairs; the inflorescence of *Siphonychia corymbosa* is more lax; the calyx furnishes good distinctive characters: that of the new species is shorter and stouter, the segments oblong, with converging tips, instead of lanceolate, with erect tips, as in that of *S. erecta*.

CLEMATIS GLAUCOPHYLLA.

Perennial, bright green, glabrous. Stem rather slender, 2–5 meters long, climbing over bushes or trees, nearly simple, dark red, furrowed, much enlarged at the nodes; leaves ovate, 3–10 cm. long, thickish, acute, often apiculate or acuminate, entire, 3-lobed or trifoliolate, with conspicuous white nerves above, prominently nerved and glaucous beneath, cordate or subcordate; floral leaves with petioles 1 cm. long, the nerves gradually diverging from the midrib; flowers reddish purple, glossy, 2–2.5 cm. long; calyx

conic-ovoid; sepals lanceolate, acuminate, the tips very slightly spreading; achenes suborbicular, 6–8 mm. in diameter, puberulent, abruptly narrowed at both ends, with an orbicular impression in the middle, sometimes slightly inequilateral, the plumose style erect or slightly oblique, 5–6 cm. long, tawny, lustrous, the hairs spreading.

Collected by the writer in the Yellow River valley, near McGuire's Mill, Gwinnett county, Georgia. In flower July 2, 1895, in fruit July 11, 1893.

A handsome species between *Clematis Addisonii* and *C. Viorna*, with foliage somewhat resembling that of the former and with the habit of the latter. It differs from *C. Addisonii* in its much elongated and climbing stem, and the distinctly petioled and acute floral leaves. It may readily be distinguished from *C. Viorna* by its suborbicular achene and longer plumose styles, as well as by the foliage.

LOBELIA FLACCIDIFOLIA.

Perennial, slender, deep green, glabrous or nearly so. Stems erect, 2–6 dm. tall, solitary, or loosely tufted, usually branched above, or, in small plants, rarely simple, the branches wire-like; leaves thin, the basal or lower cauline obovate or oblong-spatulate, the rest linear-oblong or rarely linear-lanceolate, 3–10 cm. long, obtuse, undulate or crenate-undulate, short-petioled; racemes interrupted, .5–2 dm. long, recurved; pedicels erect, slightly curved, 4–5 mm. long, usually exceeded by their bracts; calyx glabrous, its tube broadly turbinate, becoming globose-hemispheric and strongly ribbed, its segments linear-lanceolate, 4–5 mm. long, acute, spiny-toothed, auricled at the base, slightly revolute; corolla about 1.5 cm. long, blue, sparingly pubescent without, the segments of the upper lip reflexed, crisped, about ½ as long as the tube, the lower lip as long as the tube, its segments acute, the middle one lanceolate, the lateral ones oblong-lanceolate; staminal tube ascending, anthers pubescent; capsule ovoid, 5–8 mm. long, beaked, the free portion somewhat shorter than the part adnate to the calyx-tube.

In sand in deep river swamps, southern Georgia. Summer.

The species here described as new is, on the whole, most closely related to *Lobelia Ludoviciana*, from which it differs in the delicate habit, the very thin texture of the leaves and the branching stems; there are characters in the flower to separate it from the Louisiana plant in the narrower calyx-segments and narrower segments of the lips of the corolla.

The original specimens were collected by the writer in the Ochlockonee River swamp, near Thomasville, Georgia, July 12–22, 1895.

Aster Camptosorus.

Perennial, slender. Stems erect, 4–6 dm. tall, finely ridged, slightly flexuous, green or purplish green, simple or nearly so, glabrous, or very sparingly pubescent near the top; leaves few, the blades lanceolate, 6–15 cm. long, resembling the leaves of *Camptosorus rhizophyllus*, attenuate from near the base to the finely acute apex, entire, undulate, sometimes crisped, dark green, smo th and lustrous above, paler and hispid beneath with a scattered pubescence, the lower ones deeply cordate at the rounded ear-like base, the upper ones subcordate or truncate, petioled; petioles slender, villous, the lower ones nearly as long as the blades, the upper about ⅓ as long as the blades; heads usually few; pedicels angled, bearing minute appressed bracts, scabrous with short, stiff, spine-like hairs; involucres cylindric-campanulate, constricted at the middle (or turbinate in the dry state), 5 mm. high, the bracts linear-subulate, in 4 or 5 series, incurved, with a narrow green midrib and green acute tip; corolla about 6 mm. long; stamens and style glabrous; rays purple, linear-oblanceolate, 1 cm. long, slightly 3-toothed at the apex.

In open woods, in and near the mountains, Georgia and Alabama. September to October.

A very curious and handsome species on account of the close resemblance of its leaves to those of *Camptosorus rhizophyllus*. Compared with its nearest relative, *Aster Shortii*, the new species is more slender and, in addition to the *Camptosorus*-like leaves, and the characteristic gradual attenuation from the base to the apex, these organs are smooth, dark green and lustrous above. The involucre of *Aster Shortii* is campanulate, whereas that of *Aster Camptosorus* is cylindric-campanulate and constricted at the middle; the bracts in the new species are rigid, linear-subulate and incurved, while those of *Aster Shortii* are rather thin, hardly rigid and simply linear.

Fine specimens were sent to me by Prof. Carl F. Baker from Wright's Mill, five miles south of Auburn, Alabama. They were collected on October 17, 1896. In addition to these I find an old sheet in the Columbia University Herbarium on which are two specimens collected in the mountains of Georgia by Mr. Buckley.

Cryptogams collected near Jackman, Maine, August, 1895.

By F. L. Harvey and O. W. Knight.

In August, 1895, we spent a few days near Jackman, Maine, where the Canadian Pacific crosses the boundary of Maine, and collected the following cryptogams which may be interesting for locality. A few species collected at other points on the route are included. So far as we know, this region of the state has not been much explored.

Hymenomycetes.

Clitocybe phyllophila Fr. Greenville.
Pleurotus ostreatus (Jacq.) Fr. Jackman.
Hygrophorus parvulus Pk. Greenville. New to Maine.
Russula atropurpurea Pk. Greenville. New to Maine.
Panus stipticus (Bull.) Fr. Jackman.
Trogia crispa (Pers.) Fr. Jackman.
Lenzites sepiaria Fr. Jackman, Greenville and Pamedomcook.
Schizophyllum commune Fr. Decaying wood. Jackman.
Polyporus brumalis (Pers.) Fr. Jackman.
Polyporus similimus Pk. Jackman. New to Maine.
Polyporus betulinus Fr. Jackman.
Fomes pinicola Fr. Jackman.
Fomes applanatus (Pers.) Wollr. Jackman.
Fomes fomentarius (L.) Fr. Jackman.
Fomes carneus Nees. Jackman.
Polystictus perennis (L.) Fr. Jackman.
Polystictus pergamenus Fr. for. *pseudopergamenus* Thum.
P. cinnabarinus (Jacq.) Fr. Jackman.
P. versicolor (L.) Fr. Jackman.
P. abietinus Fr. Jackman.
Poria attenuata Pk. Jackman.
Trametes mollis Fr. Greenville. New to Maine.
Solenia fasciculata Pers. Greenville.
Tremellodon gelatinosum (Scop.) Pers. Jackman.

Clavarieae.

Clavaria aurea Schaeff. Jackman.

C. gracilis Pers. Greenville. New to Maine.
C. inequalis Mull. Greenville.
Calcocera carnea Fr. Jackman.

TREMELLINEAE.

Hirneola Auricula-Judae Berk. Jackman.

THELEPHOREAE.

Plicatura Alni Pk. Jackman.

GASTEROMYCETES.

Lycoperdon cubincornatum Pk. Greenville.
L. gemmatum Batsch. Greenville.
L. molle Pers. Jackman.
Bovista pila. Jackman.

UREDINEAE.

Uredo iridicola DC. On Iris. Jackman.
Puccinia asteris Duby. Jackman.

LICHENES.

Cetraria Juniperina Pinastri Ach. On coniferous trees and rail fences.
C. ciliaris Ach. Rail fenches.
Usnea barbata plicata Fr. Spruce trees.
U. longissima Ach. On spruce trees.
Alectoria jubata colybeiformis Ach. Common.
Parmelia plycodes (L.) Ach. On trees.
Physcia hypoleuca (Muhl.) Tuck. On trees.
Pyxine sorediata Fr. Specimens which Miss Cummings thinks are this.
Sticta amplissima (Scop.) Mass. Rocks and trees.
S. pulmonaria (L.) Ach. On trees.
Nephroma arcticum (L.) Fr. On rock. Sandy Bay Mt.
Peltigera polydactyla Hoffm.
Stereocaulon paschale (L.) Fr. Ground.
Cladonia pyxidata (L.) Fr. Rotton wood and earth.
C. fimbriata tubaeformis Fr. Ground.
C. gracilis verticillata Fr. Ground.
C. gracilis hybrida Schaer. Ground.
C. gracilis elongata Fr. Ground.

C. squammosa Hoffm. Ground.

C. furcata crispata Fr. Ground.

C. furcata racemosa Fl. In moss on rocks. Tumble-down-Dick stream, head of Pamedomcook L.

C. rangiferina (L.) Hoffm.

C. rangiferina sylvatica L.

C. amaurocrea (Fl.) Schaer.

Buellia parasema (Ach.) Th. Fr.

Graphis scripta (L.) Ach.

PYRENOMYCETES.

Microsphaera Vaccinii (Schw.) C. & P. Jackman (Harvey). On *V. corymbosum atrococcum* Gray.

Hypoxylon coccineum Bull. On beech. Greenville.

H. Morsei B. & C. Jackman.

HELVELLACEAE.

Physalacria inflata Pk. = (*Mitrula inflata* Schw.) Greenville, Aug. New to Maine.

Helotium citrinum (Hedw.) Fr. Rotten logs. Jackman.

Helotium aeruginosum. Jackman.

Dasyscypha Agassii (B. & C.) Sacc. On dead birch twigs. Jackman.

Embolus ochreatus Sacc. Jackman. New to Maine.

Calicium tigillare Sacc. Jackman. New to Maine.

HYPHOMYCETES.

Heydenia, n. sp. Peck, MSS. On *Polyporus abietinus.* Jackman, Aug., 1895. F. L. Harvey.

PROTOPHYTA.

MYXOMYCETES.

Fuligo septica (Link.) Geml. On moss and rotten logs. Head of Pamedomcook. Late Oct.

Tilmadoche nutans (Pers.) Rostaf. Jackman, Aug.

Tubulina cylindrica (Bull.) DeC. Rotten logs. Jackman.

Arcyria nutans (Bull.) Grev. Greenville.

Lycogala epidendrum Buxb. Decaying stumps and logs. Jackman.

Trichia subfusca Rex. Jackman. This is new to Maine.

Some rare Washington Plants.

By K. M. Wiegand.

The writer has recently had the opportunity of studying a set of several hundred Washington plants collected by Mr. J. B. Flett during the summer of 1895 and 1896. These were all either from the vicinity of Tacoma or from Mt. Rainier, and although many of them are common, some are rather rare or otherwise interesting on account of their distribution. It seemed important therefore to publish the subjoined list, which includes thirty-three of the more interesting species together with the localities furnished by Mr. Flett.

Batrachium aquatile (L.) Dumort. (With floating leaves) ponds Tacoma.

Thlaspi alpestre L. Grassy slopes, Mt. Rainier, alt. 6000 ft.

Cardamine bellidifolia L. Mt. Rainier.

Cardamine Breweri Wats. Wet places, Tacoma. Two forms, one very weak, leaves thin and flaccid; the other more strict, leaves thicker and more purplish.

Draba aureola Wats. Rocky ridges, Mt. Rainier, alt. 10,500 ft. (see Piper, Bot. Gaz. 22: 488, 1896).

Arenaria propinqua Rich. Crevasses of rocks, Mt. Rainier.

Arenaria tenella Nutt. Prairies, Tacoma.

Arenaria paludicola Rob. Bogs, Tacoma. (See Piper, Bot. Gaz. l. c.)

Silene acaulis L. Mt. Rainier.

Cerastium alpinum L. Mt. Rainier.

Geranium pusillum L. Prairies and Streets, Tacoma.

Saxifraga Notkana Moc. Swamps, Tacoma.

Oenanthe sarmentosa Nutt. Swamps, Tacoma.

Ligusticum Grayi C. & R. Grassy places, Mt. Rainier, alt. 5000 ft.

Berula erecta (Huds.) Coville. Swamps, Tacoma.

Solidago Canadensis L. Moist rich ground, Tacoma.

Grindelia Oregana Gray. At tide-water on sandy sea-shores.

Apargidium boreale T. & G. Mt. Rainier.

Hemizonia pungens T. & G. Dry waste ground, Tacoma: probably introduced.

Cotula coronopifolia L. Salt marshes on the sea-coast, introduced.

Hypochaeris glabra L. Prairies, Tacoma, introduced.

Luina hypoleuca Benth. Mt. Rainier among talus at 5500 ft. alt.

Aplopappus Brandegei Gray. Loose rock and sand, Mt. Rainier, alt. 8000 ft.

Cassiope Stelleriana DC. Mt. Rainier, alt. 5000 ft.

Newberrya congesta Torr. Dry hills in partial shade, Tacoma.

Gilia Nuttallii Gray. Grassy places, Mt. Rainier, alt. 5000 ft.

Gilia Larseni Gray. Rock piles, Mt. Rainier, alt. 7000–8000 ft.

Romanzoffia Sitchensis Bong. Above snow line, Mt. Rainier.

Pinguicula vulgaris L. Mt. Rainier alt. 3000 ft.

Polygonum Newberryi Small. Immediately above timber line, Mt. Rainier, alt. 6000 ft.

Stenanthium occidentale Gray. On rocks above the snow-line, Mt. Rainier.

Poa Lettermani Vasey. Loose sand and stones, Mt. Rainier, alt. 10000 ft.

Cornell University.

New or noteworthy American Grasses.—VII.

By George V. Nash.

Erianthus laxus n. sp.

Culms erect, stoutish, 2–3 metres tall, pubescent with appressed hairs, toward the base scanty and short, at the apex longer and copious. Nodes densely pubescent with appressed grayish hairs; sheaths striate, the inner surface spotted and tinged with red-brown, the outer surface densely hirsute with ascending gray hairs, the lower sheaths throughout, the upper ones only at the base and apex, with the intermediate portion but sparingly pubescent; ligule 3–4 mm. long, rounded at the apex, irregularly lacerate-toothed; leaves flat, 2–5 dm. long, 6–12 mm. wide, long-acuminate at the apex, a little narrowed toward the base, rough on the margins, hirsute on both surfaces, the upper surface becoming glabrous when old; panicle gray in hue, 4–5 dm. long, 1 dm. wide or less, loose, the main axis copiously pubescent with long, silky appressed hairs, as are also the elongated lax and flexuous ascend-

ing branches, the larger of which are 2–2.5 dm. long; internodes of the rachis densely pubescent with silky hairs, 6–8 mm. long, the lower internodes much exceeding the spikelets; spikelets 4–5 mm. long, one-half as long as the basal hairs, and about one-half again as long as the clavellate pedicels, which are pubescent with very short appressed hairs, and also with fewer long ascending hairs; outer scales of the spikelet pubescent with long hairs, at least at first, the first scale slightly 2-toothed at the apex, the second similar, but not so distinctly nerved, the third scale pubescent on or near the margins toward the apex, the fourth scale glabrous, or with a few hairs at the apex, purple on the margins, acuminate into a scabrous, untwisted, straight or somewhat contorted awn about 2 cm. long.

Collected by Mr. W. T. Swingle in a wet hammock between Paola and the Wekiva River, along the J. T. & K. W. R. R., on Aug. 22, 1894, No. 1732a of my first distribution of Florida plants.

The elongated branches of the panicle, the long internodes of the rachis, and the longer basal hairs of the spikelet distinguish this at once from any form of *E. saccharoides*, to which it is related.

PANICUM AGROSTIDIFORME Lam. Ill. 1: 172. 1791.

This name was given by its author to a grass from South America, probably from Cayenne, and its application to the plant so common in our region, the *P. agrostoides* Muhl., has never been satisfactory, not only because the description failed to fit our plant, but also on account of the remoteness of the region from which the Lamarckian plant originally came—a region the flora of which is tropical and not likely to contain among its members a grass native and plentiful in the eastern United States. A careful comparison of a fuller description of this plant, in Encycl. Meth. (4: 748. 1797), with material from northern South America, where this grass was originally secured, leaves little doubt as to its proper identification. Among the characters given by Lamarck is that of the ciliate margins of the sheath fissure. There are three specimens in the herbarium of Columbia University which show this character in a marked degree, one of them from northern South America, another from Turk's Island, W. I., and the third from Truando Falls, on the Isthmus of Panama, collected by Schott. These specimens agree with the description of Lamarck, in the height and the jointed and leafy character of the

culms, and in the size and form of the panicle, and the arrangement of its spikelets. The culms arise from a creeping base, a character about which Lamarck says nothing, his specimens probably not exhibiting this feature. It differs from *P. agrostoides* Muhl. in the ciliate margins of the sheaths, in the shorter leaves, the smaller spikelets, and the creeping base of the stem. In *P. agrostoides* Muhl. the leaves are much elongated, the margins of the sheaths entirely naked, and the culms are caespitose, or at all events not creeping at the base.

The plants in the herbarium of Columbia University to which allusion is made, and which are referable to this species, are:

"I. F. Holton, La Paila, April 19, 1853, No. 91," sent out in his distribution of plants from "Neogranadina-Caucana."

"Graminaceae. Saxicolae. Ripariae. Truandofalls. Schott II. 858," and in red ink "No. 6."

"Dr. Madiana, Turk's Island."

PANICUM ATLANTICUM n. sp.

Whole plant, with the exceptions noted below, papillose-pilose, with long white spreading hairs, the hairs on the upper surface of the leaves and on the summit of the culm scantier, those on the lower surface of the leaves shorter. Culms caespitose, at length branched, 3–5 dm. tall, erect or ascending, the nodes barbed with spreading hairs, a bare ring about 1 mm. long below each node; sheaths shorter than the internodes; ligule a ring of hairs 2–5 mm. long; leaves erect, rigid, thickish, linear-lanceolate, 3–10 cm. long, 4–7 mm. wide, acuminate, rough on the margins, 7–11-nerved, the middle leaves the longest; panicle broadly ovate to orbicular, 4–6.5 cm. long, 3–7 cm. wide, its main axis somewhat pilose at the base, the remaining portion, as well as the ascending somewhat flexuous branches and their divisions, hispidulous, the lower branches 2.5–4.5 cm. long; spikelets many on hispidulous pedicels several times their length, obovate, about 2 mm. long, about 1.3 mm. broad, obtuse, the first scale about one-half as long as the spikelet, broadly ovate, acute, sparingly pubescent, 1-nerved, the second and third scales equal in length, membranous, orbicular when spread out, 9-nerved, densely pubescent with short spreading hairs, the third scale enclosing a hyaline palet about one-half its length, the fourth scale chartaceous, oval to almost orbicular, about 1.75 mm. long, enclosing a palet of equal length and similar texture.

Type specimens collected by the writer on dry somewhat shaded knolls in the grounds of the New York Botanical Garden.

It has also been secured on Staten Island, New York, by Dr. N. L. Britton; and also in southeastern Virginia, east of the Dismal Swamp and south of Great Bridge, by Dr. John K. Small.

This well-marked grass is related in habit and general appearance to *P. pubescens* Lam. and *P. villosissimum* Nash, differing from the former in the larger spikelets and the longer hairs clothing the sheaths and leaves, and from the latter in the smaller and differently shaped spikelets and in the smaller panicles.

PANICUM ELONGATUM Pursh.

The longer and acuminate spikelets serve well to distinguish this from *P. agrostoides* Muhl. Another equally important and so far constant character is the distinct stalk to the scale of the perfect flower. In *P. agrostoides* the fourth scale is sessile, or nearly so, and much broader in proportion to its length.

Dr. Geo. Vasey (Contr. U. S. Nat. Herb. 3: 35, 1892) noted this feature in what he considered an eastern form of *P. agrostoides* Spreng., and which is presumably the plant now known as *P. elongatum*.

PANICUM PARVISPICULUM n. sp.

Culms 3–5 dm. tall, caespitose, erect, or later decumbent and creeping at the base, glabrous, or toward the base appressed-hirsute, nodes blackish brown, usually more or less pubescent. Sheaths shorter than the internodes, the lower ones usually appressed-hirsute, the upper puberulent or glabrous and ciliate on the margins; ligule a copious ring of hairs 3–4 mm. long; leaves erect or ascending, rigid, thickish, linear-lanceolate, rough on the margins, glabrous above, pubescent beneath, usually with short hairs, acuminate at the apex, rounded at the base, the primary leaves 3–9 cm. long, 4–8 mm. wide, the later leaves 5–6 cm. long or less; primary panicle broadly ovate, 8–10 cm. long, its branches spreading or somewhat ascending, much divided from the base, the larger 4–6 cm. long and frequently pilose at the base; spikelets numerous, 1.5 mm. long, on divergent pedicels 1–3 times as long as the spikelets, the first three scales membranous, green, densely pubescent with short spreading hairs, the first scale one-quarter to one-third as long as the spikelet, orbicular, acute, 1-nerved, the second and third scales about equal in length, broadly oval and obtuse when spread out, 7-nerved, the third scale enclosing a hyaline palet less than one-half its length, the fourth scale chartaceous, elliptic, acutish, white, enclosing a palet of eqal length and similar texture.

Type collected by Dr. John K. Small at Darien Junction, McIntosh Co., Ga., June 25–27, 1895. It is related to *P. leucothrix* Nash, in habit, but the longer and more robust culms, the sheaths which are longer in proportion to the internodes and much less hirsute or glabrous, and the larger panicle and spikelets make manifest its specific validity.

I would also refer to this species the grass collected by Mr. A. H. Curtiss, near Jacksonville, Fla., on May 4, 1893, No. 4033, and distributed as *P. nitidum* Lam. The panicle and spikelets are somewhat smaller, but in other respects it agrees.

PANICULARIA BOREALIS n. sp.

Plant glabrous throughout. Culms 6–15 dm. tall, from a creeping base, smooth, erect; sheaths loosely embracing the culm, over-lapping, smooth or roughish, the terminal one often embracing the base of the panicle; ligule 5–15 mm. long; leaves 9–23 cm. long, 2–10 mm. wide, erect, rather abruptly acuminate, rough on both surfaces toward the apex, the upper surface also often rough throughout, the smaller leaves usually conduplicate, at least when dry; panicle, sometimes nearly simple, 1.5–5 dm. long, its main axis smooth, with the lowest internode 6–11 cm. long, branches erect, smooth, single, or in 2's or 3's, the lower bearing 3–12 spikelets 4–15 cm. long; spikelets 10–17 mm. long, 7–13-flowered, appressed, on pedicels shorter than themselves, the empty scales with a broad scarious margin, 1-nerved, smooth and shining, the first acute or obtuse, one-half as long as the second, which is obtuse and erose at the apex and one-half to two-thirds as long as the first flowering scale, flowering scales 3.5–4 mm. long, about three times as long as the internodes of the rachilla, thin, a broad scarious margin at the obtuse and erose apex, 7–nerved, the nerves hispidulous, palets hyaline, slightly shorter than the scales, narrowly elliptic, shortly 2-toothed at the obtuse apex, 2–nerved, the nerves green and narrowly winged, the wings serrulate; stamens about 1 mm. long.

In water or wet places from Maine to the Catskill Mts., N. Y., Idaho, California and Washington, and northward.

The smaller spikelets with thin flowering scales, which are hispidulous on the nerves only, clearly separate this from *P. fluitans* (L.) Kuntze, in which the flowering scales are hispidulous all over the back, and of much firmer texture.

I would refer to this the following specimens:

Fernald, Van Buren, Me., July 25, 1893, No. 193.

Nash, Cairo, N. Y., July 10, 1893.

Aiton, Idaho, June and July, 1892, No. 25.

Ballard, Swan Lake, Minn., June, 1892.

Brewer & Chickering, Geneva, N. Y., June 19, 1858.

Dr. Geo. Vasey recognized this plant as distinct from *Glyceria fluitans*, giving it the varietal name of *angustata*, but I cannot find that it was ever published. The *G. angustata* T. Fries would, however, invalidate its use in this connection.

PANICULARIA BRACHYPHYLLA n. sp.

Whole plant, except the flowering scales and a slight roughness on the branches of the panicle just below each spikelet, smooth and glabrous. Culms simple, from a decumbent and creeping base, erect, slender, 6–9 dm. tall; sheaths usually longer than the internodes, closed for nearly the entire length, striate, the uppermost one elongated, somewhat keeled toward the summit, loosely embracing the culm, and enclosing the base of the panicle; ligule 6–9 mm. long, lacerated at the apex; leaves linear, acuminate at the apex, 6–13 cm. long, 4–5 mm. wide, inclined to become conduplicate, especially when dry; panicle narrow and slender, the exserted portion 3–4 dm. long, the lower internodes of the rachis 5–7 cm. long, gradually decreasing in length to the summit, where they are 1–2 cm. in length, the branches appressed, or nearly so, the lower ones in 2's or 3's, one of which is 6–11 cm. long and bears 2–3 spikelets, the remaining one or two being much shorter and bearing a single spikelet; spikelets 2.2–3 cm. long, compressed-cylindric, 7–12-(usually 8–10) flowered, on pedicels 1–2 mm. long; empty scales of the spikelet 1-nerved, acutish, with a broad white margin, the first scale about one-half as long as the second, which is 5–6 mm. in length, the flowering scales hispidulous, 7-nerved, the lower ones a little exceeding twice the length of the internodes of the rachilla, about 5.5 mm. long, 2.5 mm. wide when spread out, elliptic, the obtuse, not truncate, apex somewhat obscurely and irregularly few-toothed; palets about 6 mm long, a little exceeding the flowering scales, acuminate, the margins infolded, the apex shortly 2-toothed, 2-nerved, the nerves wing-keeled, the wing serrulate and about .3 mm. wide in the broadest part; anthers purple, 1.5–1.7 mm. long.

Growing in water in large masses in an open swamp near the N. Y. & Harlem R. R., just north of the northern line of the grounds of the New York Botanical Garden, in company with *P. fluitans*, from which it is markedly different, the shorter and more slender culms, the shorter leaves, and the much narrower panicle readily distinguishing it; in addition to these differences, the flowering scales in *P. fluitans* are shorter (about 4 mm. long),

truncate, and equal or exceed the palets. *P. brachyphylla* is really intermediate between *P. fluitans* and *P. acutiflora*, resembling the latter in habit, but at once separated from it by the smaller flowering scales, which are obtuse and not acuminate as in that species.

Robinson & Schrenk's No. 221, collected in a wet meadow at St. John's, Newfoundland, August 7, 1894, appears to be a small and simple-panicled form of this; the spikelets are fewer-flowered and the flowering scales are slightly longer, sometimes about equalling the palet, but otherwise the plant is the same.

This well-marked species doubtless occurs in other sections, but, owing to its strong resemblance in habit and general appearance to *P. acutiflora*, it has been overlooked. I should be exceedingly glad to receive more material.

Reminiscences of Botanical Rambles in Vermont.*

By C. G. Pringle.

Friends: If I can offer to-night for your entertainment only a dull and dimly outlined story of my early botanical rambles in the summer fields of my native State, let my excuse be that thronging memories of treading a thousand desert trails between the Columbia and the Tehuantepec overlie the recollections of those early glad days,

> "When the feelings were young, and the world was new
> Like the fresh bowers of Eden unfolding to view."

I cannot remember the birth of my love for plants. It must have been inborn, inherited. And it has been my happy fortune all my life to have had appointments to botanical work laid upon me, which I have accepted as in the way of destiny, and opportunities for such work to open before me, which, improved, have led on to wider and wider fields.

My boyish botanizing about home fields, which made me acquainted with our common plants, may be passed over with bare mention, as also the rambles with manual in hand on summer

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holidays when a school boy at Hinesburgh and Bakersfield and Dunham.

After some years devoted rather to the culture than to the collecting of plants, it was membership in the Massachusetts Horticultural Society which brought me in touch with the botanists of Boston and Cambridge. This was in 1873. Twenty years had elapsed since the publication by Thomson of Oakes' catalogue of Vermont plants, with Professor Torrey's appendix. During this time little seems to have been done towards enlarging these lists of Vermont plants. The young Horace Mann, shortly before wandering away to die in the Sandwich Islands, had visited Mount Mansfield, and there, in the little tarn which we call the Lake of the Clouds, had found and communicated to Dr. Englemann *Isoetes echinospora* Durieu var. *Braunii* Engelm. John H. Redfield, from the Philadelphia Academy of Sciences, had brought, June 15, 1869, from the highest peak of the same mountain, as a memento of his visit, *Diapensia Lapponica* L. But these, and such as they, seem to have come and passed as summer tourists. J. W. Congdon, Esq., now of Mariposa, California, then of East Greenwich, R. I., was something more than this when, on visits to the native place of his wife at Lyndonville, he diligently made collections of the rarer plants of that part of the State, including Willoughby Mountain. Yet I can call to mind but a single addition made to Oakes' catalogue by that gentleman, *Scirpus pauciflorus* Lightf., now known as *Eleocharis pauciflora* Watson. Charles C. Frost, the learned shoemaker of Brattleboro, remained as the one Vermont botanist, and he was still active, but so absorbed in the mysteries of cryptogams that he was forgetting the names of our common weeds; and the hills within view from his home were competent to supply him with abundant material for his studies to the end of his life. The times yielded me an opportunity and I was ready to grasp it, was fitted by possession of leisure and strength and taste, or absorbing passion, to follow out the task set me. There was at that time a want, even in the best old herbaria, of good specimens of the more interesting plants which had been found in Vermont from the days of Michaux and Pursh to those of Torrey and Frost. New herbaria were being founded, which lacked them altogether. So I was sent out on quests for these treasures. Mr. Congdon,

who could never gratify his longing to visit our higher mountains and our lake regions, wrote of a rumor current among botanists that Dr. Robbins' station for *Astragalus Robbinsii* Gray and *Anemone multifida* Poir., in the chasm of the Winooski, had been obliterated. Someone had tried to find it again and had failed. The rumor proved unfounded, yet, alas! a prophecy. The obliteration did not occur, however, till there had been gathered a supply of these plants sufficient for all the herbaria of the world. The first fresh specimens taken from there made glad the heart of Asa Gray, the author of one of the species. So did the sight of ample specimens of *Cypripedium arietinum* R. Br., and the accompanying information that it is an abundant species of Vermont pine woods, swamps and hills. So, too, *Orchis rotundifolia* Pursh, by means of fresh specimens, of which he was enabled to refer it back to the genus in which it truly belongs. And thus began relations between that great and good master and myself which continued till his death—relations which grew ever closer and more tender, until they became as the relations between father and son. It was often "tell me this" or "find me that, for you are always helpful to me." It was but a few months prior to his death that he sent me away from his side, for the third time, fully equipped by his kind and thoughtful care, to explore thoroughly a vast region. Ten years have since passed, and still my feet falter not in reverent obedience to his high commission.

In 1873 George Davenport was beginning his study of ferns. A letter from him asking me to look for *Woodsia glabella* R. Br., started me on a fern hunt. The species had been found on Willoughby Mountain, Vermont, and at Little Falls, New York; might it not be growing in many places in Vermont? When I set out I knew, as I must suppose, not a single fern, and it was near the close of the summer. You can imagine what delights awaited me in the autumn woodlands. I made the acquaintance of not a few ferns, though it was too late to prepare good specimens of them. In this first blind endeavor I got, of course, no clue to *Woodsia glabella*. The next summer the hunt was renewed and persistently followed up. I found pleasure in securing one by one nearly all our Vermont ferns. At the time I thought it worthy of remembrance that a single field of diversified pasture and wood-

land on an adjoining farm yielded me thirty species. Although the two common species of *Woodsia* were near at hand, *Woodsia glabella* was still eluding my search. I sent a friend to the summit of Jay Peak in a fruitless quest for it. Finally, on September 1st, I joined Mr. Congdon at its old station on Willoughby Mountain and made myself familiar with its exquisite form.

During the first two years of my collecting in earnest, 1874 and 1875, several visits were made to Camel's Hump, the peak most accessible to me. In this way some time was lost, because its subalpine area is limited, and consequently the number of rare plants to be found there is small. Yet, with such dogged persistence as sometimes prevents my making good progress, my last visit to that point was not made till the 20th of June, 1876. On that day I clambered, I believe, over every shelf of its great southern precipice and peered into every fissure amongst the rocks. At last, as I was climbing up to the apex over the southeastern buttress, my perilous toil was rewarded by the discovery not only of *Woodsia glabella*, but of *Aspidium fragrans* Swartz. There were only a few depauperate specimens of each which had not yet succumbed to the adverse conditions of their dry and exposed situation.

Five days previously, on the 15th of June, 1876, I had made my first visit to Mount Mansfield, and had recognized its vastly more extensive field, more alpine in character and admirably varied, so I never again climbed the Camel's Hump. On this first visit to Mount Mansfield my work was restricted to the crest of the great mountain. About the cool and shaded cliffs in front of the Summit House were then first brought to my view *Aspidium fragrans* Swartz and *Asplenium viride* Hudson, for I was still on my fern hunt. The finding of the former added a species to the Vermont catalogue; the latter was an addition to the flora of the United States. Such little discoveries gave joy to the young collector. The north peak yielded me on this visit two or three phaenogams to add to the list of Vermont plants *Vaccinium caespitosum* Michx., *Polygonum viviparum* L., *Prenanthes Boottii* Gray, though the last too mentioned must have been met with previously on Camel's Hump.

The next extended trip of this busy summer of 1876 was to

the Willoughby region for the purpose of gathering in quantity the boreal plants known there. I was on the mountain on the 4th of August, and examined the entire length of the cliffs, climbing upon all their accessible shelves. Among the specimens of *Woodsia glabella* brought away were a few which I judged to belong to a different species. Mr. Frost, to whom they were first submitted, pronounced them *Woodsia glabella*. Not satisfied with his report, I showed them to Dr. Gray. By him I was advised to send them to Prof. Eaton, because, as he said, *Woodsia* is a critical genus. Prof. Eaton assured me that I had *Woodsia hyperborea* R. Br.—another addition to the flora of the United States.

On the 22d of August I was back upon Mt. Mansfield with my friend, Dr. Varney, thinking and inquiring chiefly about the cliffs at Smuggler's Notch, which I could see in part from certain points of the summit. From the great cliffs of Willoughby Mountain I had learned the value from a botanist's point of view of such situations, and I was eager to see if these exposed ledges would not yield me something of interest. My expectations were not high, however, because I knew that two noted botanists had been in the Notch, Pursh and Frost. The latter had told me of cartloads of *Aspidium aculeatum* Swartz, var. *Braunii* Koch, to be found there; but he had said nothing of any other rare plants nor of cliffs. Early on the morning of the 23d my friend and I set out for the Notch. From a point on the Stowe road a little below the Summit House we descended the mountain side through the trackless forest. As the masses of broken rock covering the slope were half hidden beneath the shrubs and mosses, the first half of our descent was not without its perils. We entered the highway some distance below the Notch House and followed the trail through the length of the Notch, turning aside here and there to inspect the bases of the cliffs or to follow up the side gullies for a short distance. It was but a hasty survey, but it yielded me many surprises and showed me that here lay still unexplored the best botanizing ground in Vermont. I was prepared to take scarcely a sample of all the plants met with and time was lacking to do so. It was the middle of the afternoon when we turned away from the Notch and set out to climb back to the summit by the brook which descends from the south end of the Lake of the

Clouds. Hours passed while we were struggling to regain the summit and the shelter of the hotel. On all my subsequent visits I never felt a desire to follow the wild course of that first weary day.

Before the middle of September I was again in Smuggler's Notch with an assistant, and this time prepared to camp in the old Notch House amongst hedgehogs, and botanize the region day by day. The long list of plants brought out on this visit caused surprise. Here were found in abundance *Aspidium fragrans*, *Asplenium viride*, *Woodsia glabella* and *Woodsia hyperborea*. On our way home we followed the trail around the south end of Mount Mansfield, through Nebraska Notch to Cambridge, and on the cliffs of this Notch were found both the rare Woodsias mentioned above, and later *Woodsia hyperborea* turned up about the north peak of the mountain.

In the following year my delight in this preserve of boreal plants was shared with not a few genial botanists. Charles Faxon came before any of us suspected that he possessed undeveloped talent for a botanical artist of highest excellence. Edwin Faxon followed his young brother, and with me made the tedious ascent to Stirling Pond, a day of toil well rewarded. Thomas Morong came, before the hardships of his Paraguayan journey had broken him down, and he made a find over us all — a single, puny specimen of *Primula Mistassinica* Michx., possibly the last individual of its species surviving in that field. Our honored president came, and not to that field alone. In those days, as now, he was everywhere over these fields, prying sharply into the secrets of our plants and our rocks. On lake shores, on mountain tops, in sphagnous bogs and darkest swamps, he was often my companion to add delight to my occupation and to reinforce my enthusiasm. Long may his form be seen among you on field days in sedgy meadows and on wildest mountain heights — unless I can allure him away to wider, richer fields. The gentle Davenport came at last to behold for the first time in their native haunts many of the objects of his love and study. When I had found for him yet once more in a fifth Vermont station (this was under Checkerberry Ledge, near Bakersfield) the fern he at first desired, and, together with that had discovered within our limits three or four others quite as rare and scarcely expected, I might feel that I had

complied with the request of his letter. But that letter initiated a warm friendship between us and association in work upon American ferns, which has continued to the present time. During these twenty-three years of botanical travel on my part my hands have gathered all but 36 of the 165 species of North American ferns, and from the more remote corners of our continent I have sent home to my friend for description and publication 16 new ones. Yet I trust that the fern hunt upon which he started me in 1873 is still far from its close.

After those strange gardens of boreal plants, Willoughby Mountain and Smuggler's Notch, had yielded up their treasures we began to search the State to find other places offering plants peculiar conditions. We enquired first for mountain precipices, which, swept by unobstructed cataracts of cold air from high summits, would maintain in a measure the conditions of higher latitudes. I recollect having in my boyhood looked down from the verge of Checkerberry Ledge in Bakersfield upon the forest occupying the narrow valley below, and remembered it as a dizzy height. I could not rest till I could find an opportunity, June 16, 1880, to explore the base of its cliff. But after the fearful precipices of our higher mountains the place was disappointing and tame; only *Woodsia glabella* and a rare lichen rewarded my search.

People had told me of Hazen's Notch and its cliff, on the road between Montgomery and Lowell; and the following morning our good friend, Mr. Fassett, of Enosburgh, was conducting me there. This cliff was found to be of but moderate altitude and to have besides a warm southern exposure. Here *Saxifraga Aizoon* Jacq. was growing in greater abundance than I had anywhere previously seen; nothing else of interest.

It is only of phaenogams and ferns that I have yet spoken; it was not alone my duty between 1874 and 1880 to collect these, but all the lower orders as well. Charles James Sprague, of Boston, was then accumulating an herbarium of lichens for presentation to the Boston Natural History Society, and he set me to collect lichens diligently, wherever I went. If Smuggler's Notch offered the rarest of flowering plants, it yielded lichens no less rare—stragglers left behind, when the species retreated to the

shores of Labrador. So, too, of mosses, which a good authority of that day was eager to receive from me and name. And not a few were the new species of fungi found among my gatherings by Dr. Peck. To search out these classes of plants through the winter woodlands, when the fall of the leaves of other plants had made them conspicuous, afforded many a day of rarest pleasure.

It were going beyond the limits of my subject to tell of extended trips made during these years to the White Mountains, to join there the Faxons, till we became as familiar with those tempest-swept heights as with our native fields. Or to tell of boat journeys and the ample fruits of such, made in three successive years to the cold fir-set shores of the Lower St. Lawrence; to the Saguenay, low between its palisades of giant cliffs, and through the lone lakes and unbroken forests of the St. Francis to the St. John of northern Maine. Experiences of wild life calculated to fill one with large thoughts, to raise him above fear and to make the modern world of conventions and fads show paltry.

In the fall of 1880, when our thorough survey of these regions was but half completed, I was sent away on forestry service to distant States, and I have ever since wandered further and further on. But year by year I have learned with joy and pride of the achievements since made in this field of my youthful love by you, my associates, who began better prepared than I did (for I was only the first available man). Yet share the secret of success of an old collector, quit the broad plain of dull sameness, seek out every possible situation of exceptional character, and look to find amidst peculiar conditions rare and localized plants.

Reviews.

Cytologische Studien aus dem Bonner botanischen Institut. Jahrbücher für wissenschaftliche Botanik, 30: Heft 2 and 3.

In this collection of papers by Strasburger and his students a powerful impetus has been given to botanical cytology. Through their efforts mitosis in a large number of plant forms is made known, in some cases for the first time. The groups studied include fungi (*Peziza*, *Erysiphe* by Harper, and *Basidiobolus ranarum*

by Fairchild); Algae (*Fucus*, 3 species, by Strasburger, *Stypocaulon scoparium* and *Halopteris* sp.? by Swingle); Characeae (*Chara fragilis*, by Debski); Equisetaceae (*Equisetum limosum*, by Osterhout); Dicotyledons *Podophyllum peltatum*, *Helleborus foetidus*, by Mottier); and Monocotyledons (*Lilium Martagon*, *L. candidum*, *Fritillaria Persica*, by Mottier, and *Hemerocallis fulva*, by Juel). The chief results obtained were in regard to the formation of the mitotic figure, the centrosome, and reduction in the chromatin.

All work connected with the origin and structure of the spindle is based upon Strasburger's idea of kinoplasm (equivalent to Boveri's archoplasm) and trophoplasm. Strasburger himself regards these observations as demonstrating the truth of the idea and he offers still more definite views in regard to the nature of the two substances. The active kinoplasm has a fibrous structure, the active trophoplasm an alveolar structure (Wabenstruktur), but during the resting phases both substances may show only the latter structure. Perhaps the idea of Strasburger's conception of the relations of kinoplasm and trophoplasm is given by his comparison of the former with linin in the nucleus and the latter with chromatin. The nucleolus is regarded as a "reserve store" of kinoplasm and the relations therefore of nucleus and kinoplasm are considered very close. Harper's observation on *Peziza* and *Erysiphe* lead Strasburger to regard the cell membrane also as derived from kinoplasm, while Harper in addition gives to the kinoplasm a certain physiological rôle whereby it acts as a "middle-man" between the outer world and the nucleus.

The origin of the spindle-fibres from kinoplasm, and the formation of the spindle, as described by Osterhout and Mottier, are very extraordinary and are certainly not duplicated in any known animal cells. The kinoplasm, which is indicated by a characteristic color after the use of orange solutions, is first seen as radial fibres stretching out in all directions from the nuclear membrane. The fibrils next become tangential and focussed at various points in the cell, so that a multipolar spindle results. The various poles gradually fuse together until only two are left, and these form the definitive poles of the mitotic figure.

Fairchild describes a very different kind of a spindle in the fungus *Basidiobolus ranarum*. Here it arises, as in the other cases,

by convergence of bundles of spindle fibres, but convergence is not carried so far as in the bipolar types, and the result is a spindle with truncated ends. The bundles of fibres end in knob-like enlargements, which resemble centrosomes. Similar enlargements were observed by Debski at the ends of the spindle-fibres in *Chara fragilis*.

The general upshot of the various observations in regard to the centrosome is that such a body is absent in most forms of plants. Strasburger observes that centrosomes can be demonstrated in thallophytes and bryophytes, but that in pteridophytes and phanerogams the most careful search for them was in vain. If Osterhout's and Mottier's descriptions of spindle formation are correct, the conception of the centrosome as a permanent morphological element of the cell must be given up, at least so far as these plants are concerned. The very interesting observations of Juel add further evidence in this direction, Juel found that mitoses sometimes occur, in which one chromosome becomes isolated either before or after division. It forms a small cell by itself, with perfect cell-plates between it and the large daughter-nuclei. It acts like a cell in all respects; forms a nuclear membrane; passes into the resting state, and even goes so far as to form a complete spindle and to divide by mitosis. Such a case shows that a centrosome is not a necessary element in mitosis, and one must agree with Juel that "those characters which belong to the cell as such are to be found not only in the totality of the chromosomes, but also in each single chromosome."

In several cases the centrosome was very different in form from that found in most animal cells. Harper observed that the centrosome, if present at all in *Peziza* and *Erysiphe*, must be in the form of a thin flattened disc stretching across the samewhat blunt pole. The centrosome nature of the knob-like thickenings in *Chara* and *Basidiobolus* is questioned by Debski and Fairchild.

In regard to the question of chromatin reduction, the most important observations were made by Mottier on certain Liliaceae. In accordance with these results Strasburger gives up his former idea of a purely quantitative division in *Lilium* by a double longitudinal splitting of the chromosomes, and now sustains the view accepted by Haecker, Rückert and others that the second division

is a reducing division in the Weismann sense. The process of reduction in *Lilium* is now regarded by Mottier and Strasburger as follows: the double-spireme of the pollen-mother-cell segments into 12 chromosomes; each double chromosome bends to form a U; each chromosome then splits through the plane of longitudinal division during the first mitosis and the daughter-chromosomes have the form of a V. During the second mitosis each V divides transversely at the angle, a reducing division in the Weismann sense thus taking place. Each of the original double chromosomes has the value of a tetrad, the segregation of the chromatin into the compact solid tetrad being the only step lacking to make the process correspond with Haecker's description tion of tetrad formation in certain copepods. Tetrads agreeing exactly with those of animal reproductive cells were observed and pictured by Osterhout in the case of *Equisetum*, but it is to be regretted that he offers no observations regarding their mode of origin or their fate.

In many cases the conclusions drawn from the observations brought together in this important collection are not wholly satisfactory. For example, the general denial of the existence of a centrosome in the higher plants cannot be accepted upon the mere statement. Evidence to the contrary is furnished by some of the figures, as in the case of Figure 63, Plate V, where a structure is pictured at the lower pole of a cell of *Helleborus*, which agrees very closely with the centrosomes described by Guignard.

GARY N. CALKINS.

A Flora of Northwest America. Containing brief descriptions of all the known indigenous and naturalized plants, growing without cultivation, north of California, west of Utah and south of British Columbia. By Thomas Howell. Vol. 1, Phanerogamae, Fasicle 1, Ranunculaceae to Rhamnaceae. Price 50 cents. Portland, Oregon. March 15, 1897.

One of the most interesting and welcome contributions to Botany that has recently appeared is, without doubt, the first fascicle of Howell's "Flora of Northwest America."

The author's remark in his preface, that all the territory of the United States of America, south of the British boundary, except Oregon, Washington and Idaho, is supplied with "Floras," is

in a certain sense true. Although we have no local "Floras" that can be called in any sense really good or exhaustive, with the exception, perhaps, of those covering the northeastern part of the continent, all parts of the United States, except the States mentioned, have some publications concerning their flora.

As being the first local flora of the northwestern part of our country, Professor Howell's "Flora" is, therefore, doubly welcome. The territory covered, as indicated by the title, viz., west of Utah, should include the western half of Idaho and a small portion of western Montana. It is doubtful, however, if the "Flora" can be said to represent this region, especially the mountain districts of northern Idaho and western Montana, as their flora is yet comparatively little known, and it is doubtful if Professor Howell has had access to the collections made in the last few years by Sandberg, Leiberg, Heller, McDougal and Henderson, in Idaho, and by R. S. Williams, Professor Kelsey and Frank Tweedy, in Montana.

If the region is limited to Oregon, Washington and a small portion of Idaho, then it is safe to say that none of our local manuals and reports, except those of the northeastern United States, better represents the region covered than does Professor Howell's work. It is well known that the author has spent many years in collecting material for his work, having studied the flora, not only in the herbarium, but also in the field.

In his preface Prof. Howell makes the following humble remarks: "As the writing of descriptions of plants at this late date is, to a great extent, writing or copying what others have previously done, it is hardly right to claim originality for work done in that field, I, therefore, wish to acknowledge here, that I have used the works of Torrey and Gray, . . . and others." In the list given the author has omitted the name of Dr. B. L. Robinson. It is perhaps intended to be included in the words "and others," but if the most important sources are to be given, Dr. Robinson's work, especially as far as the present fascicle is concerned, has more right to be mentioned than that of several given in the list.

Although the descriptions of several species not seen by the author are simply copied, the work can in no way said to be a mere compilation. The individuality of the author shows itself

in more than one way. The following new species are described in the present fascicle: *Ranunculus ciliosus*, *Coptis venosa*, *Delphinium Oreganum*, *Aconitum bulbiferum*, *Roripa Columbiae*, *Arabis furcata*, *A. Koeleri*, *Lepidium reticulatum*, *Silene Gormani*, *Alsine Simcoei*, *Montia humifusa*, *Sidalcea virgata*, *Geranium Oreganum*, *Limnanthes gracilis*, *L. pumila* and *L. floccosa*.

In the whole fascicle, only six varieties are acknowledged. All others are raised to specific rank. The course taken is, in general, in the right direction. A form that can be well be defined is better regarded as a species, but has not Prof. Howell overdone the matter? If all the rest were made species, why leave those six as varieties?

In raising the varieties to specific rank, Prof. Howell has in most cases, preserved the varietal names, but *Ranunculus occidentalis Lyallii* becomes *R. Greenei*, *Nasturtium terrestre occidentalis* Wats. becomes *Roripa Pacifica*, *Silene Douglasii brachycalyx* Robinson becomes *S. Columbia*, *Arenaria Fendleri subcongesta* becomes *A. Barkei*, for what reason is not apparent.

The sequence is, with some modification, the same as that in the Synoptical Flora, and the general arrangement, keys, etc., are somewhat similar. Synonyms are given whenever the author's nomenclature differs from the generally accepted one.

P. A. R.

Synoptical Flora of North America: Vol. I. Part I. Fascicle II. Polypetalae from the Caryophyllaceae to the Polygalaceae. By Asa Gray, LL.D., continued and Edited by Benjamin Lincoln Robinson, Ph.D., with the collaboration of William Trelease, Sc.D., Director of the Missouri Botanical Garden; John Merle Coulter, Ph.D., Professor of Botany in the University of Chicago; and Liberty Hyde Bailey, M.Sc., Professor of Horticulture in Cornell University. (Issued June 10, 1897.)

The prompt appearance of another fascicle of this important work is a gratifying reminder of the continuous activity which, under notably capable direction, steadily draws nearer the goal sought by the ample enterprise and high abilities of Dr. Gray.

The two sections of the work first issued were published by Dr. Gray in 1878 and 1884, being part I. of volume II. and part II. of volume I. comprising the entire Polypetalae. After an in-

terval of eleven years the first fascicle of part I. volume I. appeared in October, 1895, and was reviewed in the BULLETIN of the following month. This was edited by Dr. Robinson largely from the manuscript left by Dr. Gray and by his immediate successor Dr. Watson. The fascicle now issued is intended to be bound with fascicle I., the two forming together a volume of 505 pages furnished with a complete index and preliminary key to the orders, here so termed. The whole volume covers forty-five families of Polypetalae from Ranunculaceae to Polygalaceae. A third fascicle now in preparation will include the Leguminosae.

The modern principle of coöperation has entered into the making of the fascicle now before us, and the names of President Coulter, Dr. Trelease and Prof. Bailey add their special authorities to the exposition of several important families. The text of most of the families, however, is credited directly to Dr. Gray, and for the most part appears to have been derived verbatim from his manuscript, revealing unmistakably his effective handiwork in technical description. Prof. Coulter has returned to the Hypericaceae and Dr. Trelease to the Geraniaceae, both authors finding something to add to their former useful monographs, but, be it said in regard to certain points, curiously exposing themselves to attack with their guards down. Prof. Bailey has contributed especially the genus *Vitis*.

Dr. Robinson's own contributions to the work, besides the multifarious and exacting detail of editing, has consisted in the treatment of several special genera and minor families, and more particularly of the extensive and attractive family Caryophyllaceae, and of the Sapindaceae and Polygalaceae. The descriptions are, as a rule, admirable, and it is evident that the later hand has caught much of the clear-cut facility of the master.

We cannot help observing, however, that here and there the treatment of species and genera and, what is of less consequence, their names, seems to betray a proneness to linger within the comfortable precincts once occupied by a sound conservatism under the conditions belonging to a period not yet remote but rapidly passing back into the domain of botanical antiquity. We are hence disposed to arraign the editor for a too conscientious adherence in the interest of conformity to the methods and theories

which controlled the earlier issues of the work nearly twenty years ago. The intervening time in its almost revolutionary upheaval and advance cannot be slighted, and any work of the present day which does not sufficiently recognize it must fail of quite the position it might otherwise attain. The attitude regardant has its graces but also is not without its dangers. If in the present case it has made it the more difficult to discern the value of recent advanced work in discrimination it is all the more regrettable since a major part of such work, at least in phanerogamic botany, has clearly been done in a spirit of conservatism not the less regardful of the truth of nature because moving more freely in the broader lights of the present day.

It may well be questioned whether the idea that a species is after all but a conception of the individual mind has not been carried too far. At best the doctrine expresses only a half-truth and in practice gives a wide range of liberty either destructive or creative according to the bent of each new systematist. More profound even than the phenomena of change and development resulting in intergradation, is the mysterious fact of fixity of type revealing itself in a certain all but invincible individuality. This in many an organism we find surviving the most diverse environments and remaining unperturbed amid a crowding pressure of other types visually so similar that only a practiced eye and understanding can perceive them to be different. A clear apprehension of such facts as these may well give us pause when tempted to discredit the conclusions of any student who may have had greater advantages or employed greater industry then ourselves in the investigation of any particular group. The too ready reduction of critical species which the future will only reinstate can only have the effect of impairing the prestige of an author and limiting the authority of his work.

However inapplicable these strictures may be to very much in the work before us which is incontestably of a high order of excellence, we wish particularly to disclaim their application to the treatment of the genus *Vitis*. This is truly a piece of constructive work of conspicuous merit both in larger modelling and lesser detail. The simple order which has here been resolved out of the veritable bacchanalian confusion into which our grapes had

fallen furnishes an effective illustration of the utility of latter-day practice. The descriptions are the most detailed and lengthy in the volume, perhaps the least technical. It is evident that the author's aim has been not alone to set down the species in formal terms, but to effect in the mind of the intent student some realization of the individuality of the particular species discussed. There is here an escape from the trammels of the labeled sheet to the presence of the living plant, and it is refreshing to find species kept distinct *because they are so*, even though the herbarium may appear to deny it. Professor Bailey knows his species and his own convictions help to carry their realizations into the minds of others.

It must not be understood that here alone in the work facts are held to be paramount to mellowed dicta concerning facts. Elsewhere there is, indeed, a certain inertia of opinion shown here and there which is perhaps justly censurable in some such terms as these. But the progressive spirit, if sometimes dormant, shows itself to be only napping after all and quite capable of an energetic awakening as, for instance, in the case of the genus *Spergularia*, here tenaciously so called. Whatever sacrifice of consistency is involved in the treatment of this group will be criticised by no one viewing the result, which is well and logically worked out. No consensus of opinion will support the author's implied view that the genus represents scarcely more than a single polymorphous species. But this point of view, however oblique, has not been allowed to interfere with a direct and essentially true rendering of the facts. Fourteen species and major varieties are admitted and several minor varieties indicated. Nevertheless it is probably not too much to say that the group will have to be still further enlarged, and that some of the more obscure of the "oft-recurring forms," to use Dr. Robinson's apt phrase, will some day define themselves to us in clearer outlines. It is not probable, for instance, that Professor Greene's species and subspecies have so little power of resistance that they will consent to remain with their faces to the wall as several of them in this genus here find themselves placed.

In connection with the publication of this work should be noted the almost coincident appearance of the second volume of

Professor Britton's and Judge Brown's "Illustrated Flora of the Northern States and Canada." The two works, differing much in scope and purpose, may be taken together as, in some sort, a measure of the widely extended interests and activities connected with the study of our flora which has especially marked the last decade. More than this, they may be understood as being actually an organic part of these very movements—the agency through which a widely diffused subjective interest has found, as inevitably it must have found, its adequate concrete expression.

It is gratifying to note the large measure of accord between the two works; and, after all, most of the points of disaccord may be taken as evidence that our knowledge is still in a formative stage and subject to widely different understandings. But later understandings based on our present lights have so often recently proved to be the correct ones that the generally forward attitude of the "Illustrated Flora" can scarcely fail to make its pages on many points a final court of appeal.

The "Synoptical Flora" covers far the wider field and will be indispensible outside of the boundaries set down for the "Illustrated Flora." Within these boundaries the latter will fill a position of authority and usefulness such as no other publication relating to our flora has hitherto enjoyed.

Certainly no previous period of our botanical history has been enriched with any benefit at all commensurate in proportions and value to that which these works now confer.

E. P. B.

Report on the Coal and Lignite of Alaska. W. H. Dall, 17th Ann. Rept. U. S. Geol. Survey, Part 1, 763–908. *pl. 48–58* and illust. in text. 1896.

This report contains numerous references to the fossil vegetation found at the various localities, and Appendix I. to the report consists of a complete enumeration of the fossil flora as far as known, together with a table of distribution for both America and the Old World, by Dr. F. H. Knowlton. It is almost entirely of tertiary age. A. H.

Proceedings of the Club.

WEDNESDAY EVENING, MAY 26, 1897.

President Brown presided, and there were 43 persons present.

An announcement from the Scientific Alliance of the city was read, stating that the funds of the Alliance would provide this year for printing the annual directory and monthly bulletins without calling upon the several societies for contributions.

The scientific program was then taken up. Mrs. Britton repeated the lecture given at the Brooklyn Institute on April 20th, the subject being "The Mosses of the Adirondack Mountains," illustrated by lantern slides made by Mr. Van Brunt, and also by about 150 sheets of mounted specimens collected in the vicinity of Adirondack Lodge and Lake Placid in the years 1892, 1894 and 1896. The various locations where these mosses grew were described, including a climb up Whiteface, and the following list of rare species was given. From Avalanche Pass, *Myurella julacea*, *Rhabdoweisia denticulata*, *Schistostega osmundacea* and *Bryum concinnatum*, the latter having been found only once before in the United States, by Professor Peck. From the vicinity of the Lodge, *Anacamptodon splachnoides*, *Dicranodontium longirostre*, *Rhabdoweisia fugax*, *Neckera oligocarpa*, several forms of *Hypnum recurvans*, including *H. laxepatulum*, the capsules of *Dicranum viride*, and *Zygodon viridissimus*, sterile, but bearing gemmules. From Mt. Marcy, *Dicranum Sauteri*, *Raphidostegium Jamesii*, not previously reported for the State, *Hypnum uncinatum* var. *plumulosum*, *Hypnum stramineum*, *Aulacomnion turgidum*, *Sphagnum sedoides* and *Tetraplodon mnioides*. From Moose Id., Lake Placid, *Buxbaumia indusiata*, *Homalia Jamesii* and *Onchophorus Wahlenbergii*. From the cliffs at Cascadeville, *Blindia acuta*, *Myurella Careyana*, *Swartzia montana*, *Didymodon rubellus*, *Bartramia Oederiana*, *Encalypta ciliata*, *Leptotrichum glaucescens*. Duplicates of all of these have been deposited at the State Herbarium at Albany, the main collection having been presented to the Herbarium of Columbia University. Partial sets were sent to the Brooklyn Institute, Cornell University, and various other institutions.

The subject of the lecture was further discussed by Mr. A. J.

Grout and by Mrs. Britton, followed by an inspection of the many sheets of mounted mosses displayed on the walls.

The Club then adjourned to the second Tuesday in October, field meetings to continue Saturdays meanwhile as usual.

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* This record is compiled by the editors with the coöperation of Prof. Conway Macmillan and Mr. T. H. Kearney, Jr., under advice from the Committee on Bibliography of the Section of Botany, American Association for the Advancement of Science. The titles are reprinted on cards by the Cambridge Botanical Supply Company, furnishing a card catalogue since January, 1894. Authors are requested to communicate omissions from the index to the editor. Under the advice of the Committee, approved by the Section of Botany, titles of purely bacteriological, horticultural and agricultural papers are excluded.

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